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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,405	02/05/2002	Noriaki Ikenaga	Q68355	4115
23373	7590	03/01/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			CROWELL, ANNA M	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/062,405

Applicant(s)

IKENAGA ET AL.

Examiner

Michelle Crowell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 1-4, 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-7 and 10-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Status of Claims***

Claims 1-13 are pending. Claims 1-4, 8, and 9 are withdrawn from consideration. Claims 5-7 and 10-13 are rejected.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 5-7, 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plester (WO 95/22413) in view of Denholm et al. (U.S. 5, 911,832) or Liebert et al. (U.S. 6,020,592).

Referring to Figures 1 and 2, page 8, line 19-page 9, line 12, and page 10, line 2-page 13,

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line 17, Plester discloses an apparatus for modifying a surface of a container made of a polymeric compound comprising: a reception chamber 1 adapted for receiving the container 2 while keeping airtightness; a vacuum pump for evacuating the reception chamber 1 (pg 11, line 35-page 12, line 2); a plasma generating unit 6 for generating plasma in the reception chamber 1 (pg 10, lines 11-13); an electrode 3 adapted for being inserted into the container 2 received in the reception chamber 1 (pg 10, lines 11-16); and a high voltage power source 6 for applying high voltage to the electrode (pg 10, lines 11-16); wherein an interior side surface layer of the container received in the reception chamber is modified into a material that is not permeable (pg. 9, lines 3-12, pg. 13, lines 4-17, and claims 28-29).

Regarding the claim limitation of a material that is not permeable by **carbon dioxide gas and oxygen** or a material that is hard to be permeated by **carbon dioxide gas and oxygen**, it should be noted that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Thus, since the interior side surface layer of Plester is an inert or impermeable material, the apparatus of Plester is capable of not being permeated by or hard to be permeated by carbon dioxide gas and oxygen.

Plester fails to teach applying high voltage positive pulses to the electrode and an apparatus that implants ions into an interior side surface of the container.

Referring to column 4, line 3-column 5, line 40 of Denholm et al. or column 4, lines 50-57 and column 5, lines 12-33 of Liebert et al., Denholm et al. or Liebert et al. discloses an apparatus that applies high voltage positive pulses to an electrode inside of the chamber in order

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to accelerate (implant) ions into the substrate with the desired depth and dose of impurity material (col.4, lines 33-38 of Denholm et al., col.5, lines 22-30 of Liebert et al.). Additionally, since it is well established in the art that a substrate is merely the material that is processed or worked upon by the apparatus, the substrate in the instant application is simply the interior side surface of the container. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply high voltage positive pulses to the electrode inside of the container of Plester as taught by Denholm et al. or Liebert et al in order to accelerate ions into the interior side surface of the container with the desired depth and dose of impurity material. Additionally, with respect to the claim limitation of “wherein the apparatus implants ion in the generated plasma into an interior side surface of the container received in the reception chamber and modifies the interior side surface layer”, this limitation is considered a process limitation. Thus, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, since the apparatus of Plester in view of Denholm et al. or Liebert et al. includes the structure of an electrode located inside the container and a high voltage power source for applying high voltage pulses to the internal electrode, then apparatus of Plester et al. in view of Denholm et al. or Liebert et al. is capable of performing the claimed ion implantation.

With respect to claim 6, Plester further includes the apparatus having a magnetic field generating unit 36 for generating a magnetic field in the reception chamber 1 (Fig. 2C, pg. 14, lines 22-26).

With respect to claim 7, Plester further includes the apparatus having a gas supply source 4 for supplying gas into the reception chamber 1 (pg. 10, lines 5-8).

With respect to claim 10, Plester further includes the apparatus wherein the high voltage power source 6 also serves as the plasma generating unit 6 (pg 10, lines 11-16).

With respect to claim 13, Plester further includes the apparatus wherein the container 2 made of a polymeric compound such as polyethylene terephthalate (pg. 13, line 3, line 13, claim 11).

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plester (WO 95/22413) in view of Denholm et al. (U.S. 5, 911,832) or Liebert et al. (U.S. 6,020,592) as applied to claims 5-7, 10, 12, and 13 above, and further in view of Hayashi et al. (U.S. 5,578,130).

The teachings of Plester in view of Denholm et al. or Liebert et al. are discussed above.

Plester in view of Denholm et al. or Liebert et al. fails to explicitly teach a solenoid coil.

Referring to column 6, lines 44-61 and column 8, lines 14-19, Hayashi et al. teaches an apparatus wherein the magnetic field generating unit is a solenoid coil. Solenoid coils are used to apply a magnetic field for enhanced plasma density. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the magnetic field generating unit of Plester in view of Denholm et al. or Liebert et al. to be a solenoid coil since it is an equivalent means of applying a magnetic field for enhanced plasma density.

***Response to Arguments***

Applicant's arguments filed May 25, 2005 have been fully considered but they are not persuasive.

I. Applicant has argued that there is no motivation to combine Plester with Denholm et al. or Liebert et al. found in any of the cited references. However, referring to column 4, lines 33-38 of Denholm et al., the prior art specifically teaches that high voltage pulses generate high energy ions and accelerate the ions towards the workpiece. Additionally, referring to column 5, lines 22-30 of Liebert et al., the prior art teaches that the desired depth and dose impurity material is achieved based on the high voltage pulses. Thus, based on the prior art teachings, the motivation to combine Plester with ~~Plester~~ with Denholm et al. or Liebert et al. is to accelerate ions into the interior side surface of the container with the desired depth and dose impurity material.

II. Applicant has argued that modifying the Plester apparatus according to the teachings of Denholm would fail to result in a uniform gas density near the interior surface of the surface of the container since it would need the manifold 32 as required by Denholm et al. However, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, it should be noted that Plester et al. has a gas inlet arrangement and internal electrode and therefore does not require the manifold 32 of Denholm et al. Thus, Denholm et al. was simply applied for the teachings of

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modifying a surface through ion implantation by applying high voltage positive pulses to a electrode (col. 4, lines 33-38 of Denholm et al.). Therefore, the combination of Plester in view of Denholm et al. or Liebert et al. teaches an apparatus capable of applying high voltage pulses to the electrode in order to implant ions into the surface of the container.

III. Applicant has argued that Plester emphasizes coating the inside of the container and not modifying the inside of the container to generate an impermeable surface through surface reaction of ion implantation. As discussed on page 12, lines 29-32 and claim 13, Plester teaches coating the inside of the container. However, as discussed on page 4, lines 13-24, page 8, line 19-page 9, line 2, and page 13, lines 4-17 and claims 28-29, Plester alternatively can modify the inside of the container to produce an impermeable surface through surface reaction.

Additionally, one cannot show nonobviousness by attacking references (Plester) individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It should be noted that Plester teaches modifying the interior side surface of the container by surface reaction by using an electrode inside of the container (pg. 13, lines 4-17 and claims 28-29). Denholm et al. or Liebert et al. teach modifying a surface through ion implantation by applying high voltage positive pulses to a electrode (col. 4, lines 33-38 of Denholm et al., col. 5, lines 22-30 of Liebert et al.). Thus, the combinations of Plester and Denholm et al. or Liebert et al. teach the feature of modifying the interior side surface of the container through ion implantation by applying high voltage positive pulses to the electrode.



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IV. In response to applicant's argument that neither Denholm et al. nor Liebert can implant ions to the interior side surface of the container since it since the container would be disposed on a plate, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant application, Denholm et al. and Liebert et al. were simply applied for the teaching of pulsing the electrode of Plester and not to replace the electrode or add a plate (by holding the container on a plate) to the apparatus of Plester.

V. Applicant has argued that Plester fails to teach applying high voltage pulses to the electrode in order to implant ion to the interior side surface of the container. However, as stated above in argument III, this claim limitation is not solely taught by Plester, but is taught by the combination of Plester in view of Denholm et al. or Liebert et al. As stated above, Plester teaches modifying the interior side surface of the container by surface reaction by using an electrode inside of the container (pg. 13, lines 4-17 and claims 28-29). Denholm et al. or Liebert et al. teach modifying a surface through ion implantation by applying high voltage positive pulses to a electrode (col. 4, lines 33-38 of Denholm et al., col. 5, lines 22-30 of Liebert et al.). Thus, the combinations of Plester and Denholm et al. or Liebert et al. teach the feature of modifying the interior side surface of the container through ion implantation by applying high voltage positive pulses to the electrode.

VI. With respect to the applicant's arguments that the claims are enabled, the Examiner accepts the applicant's supported definition of ion implantation, and thus withdraws the 35 U.S.C. 112 rejection.

VII. In summary, it should be noted that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In the instant case, the apparatus of Plester in view of Denholm et al. or Liebert et al. discloses the structure of a reception chamber, a vacuum pump, a plasma generating unit in the reception chamber, an electrode inserted in the container,, and a high voltage power source for applying high voltage pulses to the electrode. Thus, since the apparatus of Plester in view of Denholm et al. or Liebert et al. satisfies the claimed structurally requirements, it is capable of implanting ions into and modifying the side surface of the container. Therefore, the apparatus of Plester in view of Denholm et al. or Liebert et al. satisfies the claimed requirements.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mackowski'538 teaches a container wherein the surface is treated by plasma.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Michelle Crowell  
Patent Examiner  
Art Unit 1763

*me*

*P.L.*  
Parviz Hassanzadeh  
Supervisory Patent Examiner  
Art Unit 1763